

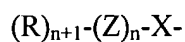
**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

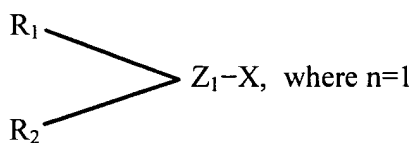
**LISTING OF CLAIMS:**

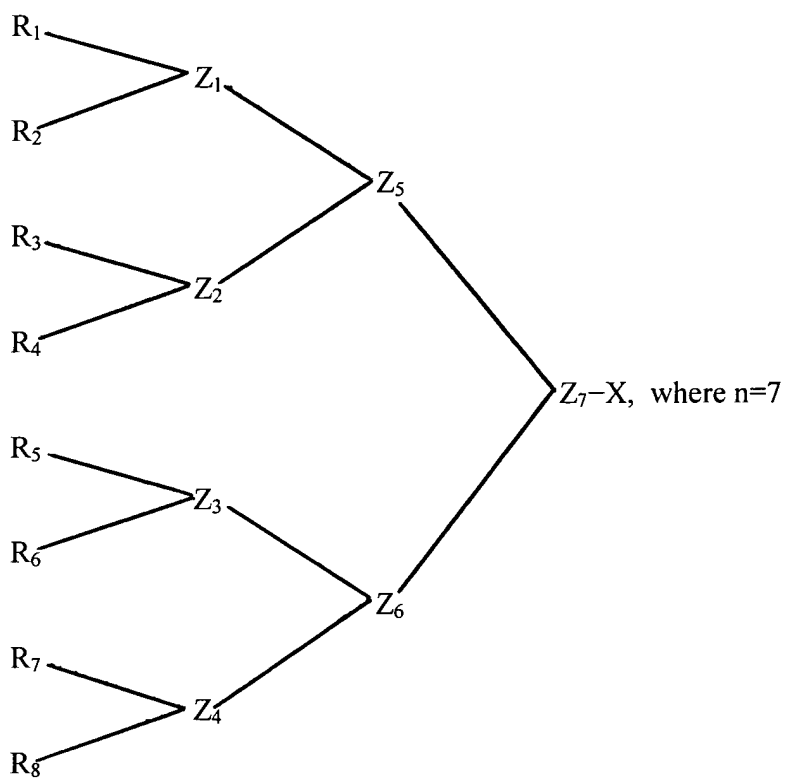
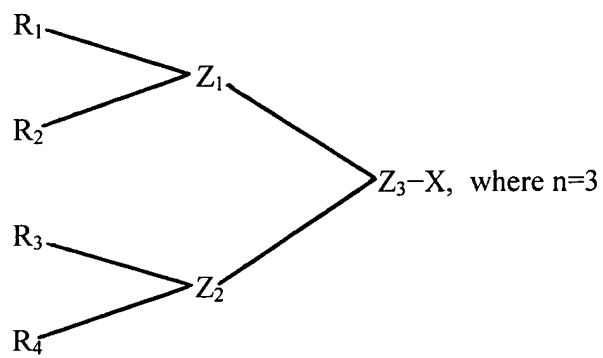
Claims 1-4 (Cancelled).

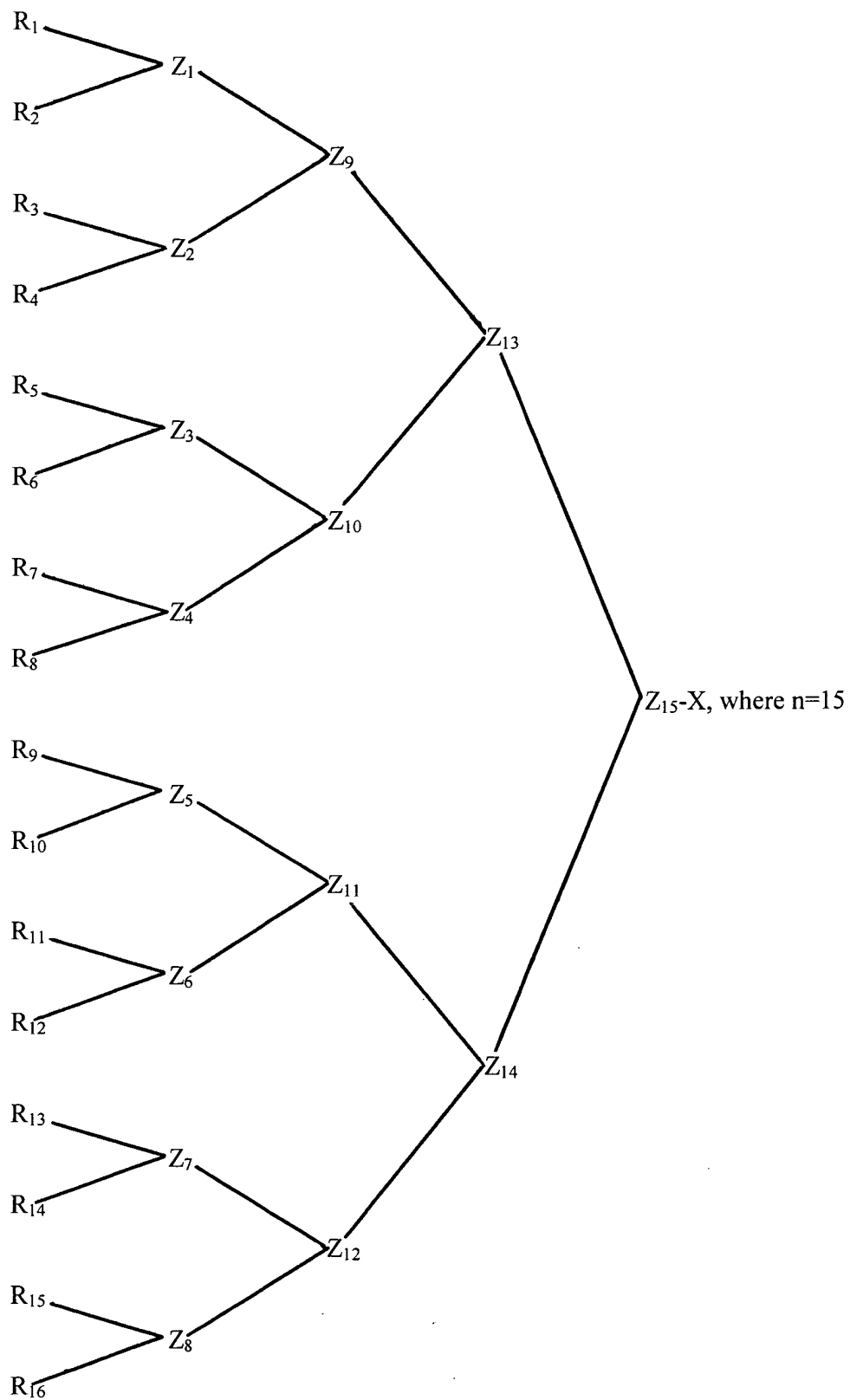
5. (Currently Amended) A composition of matter for the active structure MAP-S wherein MAP is an organic molecule which is covalently bound to a substrate S, wherein S is selected from the group consisting of metal, alloy, ceramic, natural polymer, synthetic polymer, bioabsorbable polymer, liquid polymer and combinations and blends thereof, and the organic structure MAP is selected from:



wherein n is selected from 1, 3, 7 or 15, producing the following structures:







~~R and Z in each MAP structure are the same or a different moiety~~; each R contains any type and number of cell-binding ligands, anti-inflammatory structures, anti-thrombogenic structures, growth factor structures, adhesive or adhesion barrier structures, and their combinations, with the proviso that, the MAP has active functional groups to covalently link the MAP structure to the surface of the substrate (S), located on group X, Z or R;

X is an active or protected linking group selected from the group consisting of amine, linked amino acids of 1 to 5 in length, (X1 to X5) which when present are the same or different, carboxylic acid, anhydride, hydroxyl, carbonyl succinimide (NHS) and siloxane;

each Z is independently selected from lysine or ornithine ~~the group consisting of lysine, polylysine,  $\beta$ -alanine, ornithine, or polyornithine;~~

~~each Z when present in the MAP structure as polylysine or polyornithine comprises a total of up to about 500 amino acids;~~

each R when present in the MAP structure ~~comprise~~ comprises a total of up to about 100 amino acids, and wherein each R<sub>1</sub> to R<sub>16</sub> is comprises GTPGPQGIAGQRGVV (SEQ ID NO:1)[[;]] .

6. (Currently Amended) The composition of matter of Claim 5 wherein S is selected from the group consisting of hydroxylapatite, stainless steel, ~~cobalt-chromium, molybdenum alloy,~~ cobalt-chromium-molybdenum alloy, titanium, ~~titan~~ titanium alloy, polypropylene, polyethylene, polystyrene, polyether, polyamide/polyethylene copolymer, polychloroprene, polyester, polyvinyl chloride, polyolefin, polyphenolic, polyhydroxyacid, ABS epoxy, polytetrafluoroethylene, expanded polytetrafluoroethylene, polytetrafluoroethylene/polyethylene copolymer, fluorinated ethylene propylene, polyvinylidene, ~~hexafluoropropylene~~ hexafluoropropylene, polyurethane, polysiloxane, polyisoprene, silicone, styrene butadiene, natural rubber, latex rubber, polyethyleneterephthalate, polycarbonate, polyamide, polyaramid, polyaryl ether ketone, polyacetal, polyphenylene oxide, polysulfone, polyethersulfone, regenerated cellulose, polyamino acids, polyarylsulfone, polyphenylene sulphide, polybutyl-terephthalate (PBT), poly(glycolide), HEMA and combinations thereof.

Claims 7-9 (Cancelled).

10. (Previously Presented) The composition of matter of Claim 5 wherein  $Z_1$  to  $Z_{15}$  is lysine.

11. (Currently Amended) The composition of matter of Claim 5 wherein MAP is MAP4 and  $R_1$  to  $R_4$  are each independently selected [[of]] from linear peptides having about 50 amino acids or less.

12. (Currently Amended) The composition of matter of Claim 5 wherein MAP is MAP8 and  $R_1$  to  $R_8$  are each independently selected from linear peptides having about 50 amino acids or less.

13. (Previously Presented) The composition of matter of Claim 5 wherein MAP is MAP16 and  $R_1$  to  $R_{16}$  are each independently selected from linear peptides having about 50 amino acids or less.

Claims 14-17 (Cancelled).

18. (Currently Amended) The composition of matter of Claim 5 wherein

S is selected from the group consisting of polytetrafluoroethylene (PTFE) and hydroxylapatite;

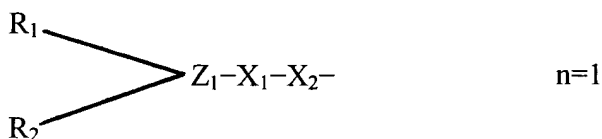
X is  $X_1$ - $X_2$ , and  $X_1$  and  $X_2$  are selected from the group consisting of carboxyl and amino acid;

$Z_1$  to  $Z_{15}$  are lysine; and

$R_1$  to  $R_{16}$  is ~~Gly-Thr-Pro-Gly-Pro-Gln-Gly-Gln-Arg-Gly-Val-Val~~ are  
GTPGPQGIAGQRGVV (SEQ ID NO:1).

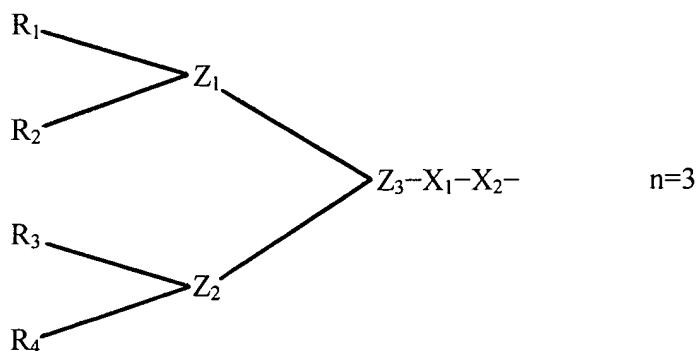
19. (Currently Amended) The composition of matter of Claim 5 wherein:

MAP is MAP2 of the structure:



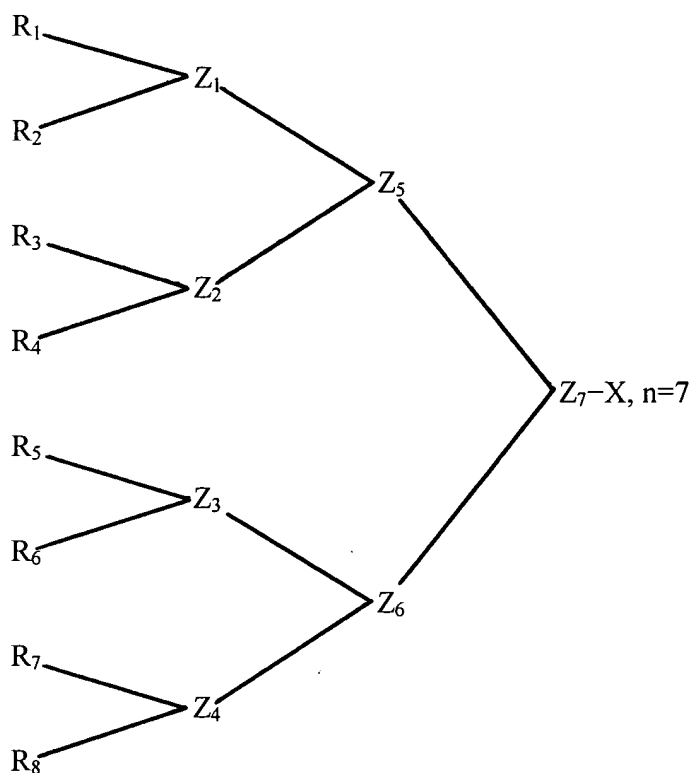
[[Z]]  $\underline{Z_1}$  is lysine and  $R_1$  and  $R_2$  are each ~~Gly-Thr-Pro-Gly-Pro-Gln-Gly-Gln-Arg-~~,  
~~Gly-Val-Val~~ GTPGPGIAGQRGVV (SEQ ID NO:1);

MAP is MAP4 of the structure:



$Z_1$ ,  $Z_2$  and  $Z_3$  are lysine and  $R^1, R^2, R^3$  and  $R^4$  are each ~~Gly-Thr-Pro-Gly-Pro-Gln-~~  
~~Gly-Gln-Arg-Gly-Val-Val~~  $R_1, R_2, R_3$  and  $R_4$  are each GTPGPGIAGQRGVV (SEQ ID  
NO:1); or

MAP is MAP8 of the structure:



$Z_1$  to  $Z_7$  are lysine and  $R_1$  to  $R_8$  are each selected from ~~Gly-Thr-Pro-Gly-Pro-Gln-Gly-Gln-Arg-Gly-Val-Val~~ GTPGPQGIAGQRGVV (SEQ ID NO:1); and X is  $-X_1-$  or  $-X_1-X_2-$  wherein  $X_1$  and  $X_2$  are selected from lysine, ornithine or alanine.

20. (Previously Presented) A pharmaceutical composition which comprises:

a pharmaceutically acceptable amount of MAP of Claim 5 in combination with a pharmaceutically acceptable carrier.

21. (Previously Presented) A pharmaceutical composition which comprises a pharmaceutically acceptable amount of MAP2, MAP4 or MAP8 of Claim 5 with a pharmaceutically acceptable carrier.

22. (Previously Presented) An implant comprising: a matrix formed of a multiple arm peptide-substrate (MAP-S) formed of a biomaterials coated substrate S and a multiple MAP peptide of Claim 5 combined by covalent binding to the substrate, wherein the MAP peptide has terminal ligands which have enhanced properties for cell adhesion, migration, cell differentiation, cell proliferation, anti-inflammation, anti-thrombogenesis, cell growth, adhesion barrier and combinations thereof.

Claims 23-24 (Cancelled).

25. (Currently Amended) The implant of Claim 22 wherein the peptide MAP has a peptide sequence selected from the group consisting of ~~MAP ID NO:13—MAP ID NO:48 inclusive~~ MAP ID NO:13, MAP ID NO:14, MAP ID NO:15, MAP ID NO:22, MAP ID NO:23, MAP ID NO:24, MAP ID NO:31, MAP ID NO:32, MAP ID NO:33, MAP ID NO:40, MAP ID NO:41 and MAP ID NO:42.

26. (Cancelled).

27. (Currently Amended) The implant of Claim ~~26~~ 30 wherein:  
the peptide MAP is selected from a MAP4 or MAP8.

28. (Currently Amended) The implant of Claim 27 wherein:

R<sub>1</sub> to R<sub>8</sub> when present are ~~selected from~~ GTPGPQGIAGQRGVV (SEQ ID NO:1), and Z<sub>1</sub> to Z<sub>7</sub> are lysine, and X<sub>1</sub> and X<sub>2</sub> are selected from β-ala-COOH, β-ala-CONH<sub>2</sub>, lys, or lys(NH<sub>2</sub>).

29. (Currently Amended) The implant of Claim 28 wherein S is selected from the group consisting of e-PTFE, PTFE, polysulfone, polyurethane, silicone, titanium ~~or~~ and titanium alloy.

30. (New) The implant of Claim 25 wherein the substrate is selected from polymer materials selected from the group consisting of hydrocarbons, fluorocarbons, elastomers, engineering thermoplastics, and metallic materials.

31. (New) The implant of Claim 30 wherein the hydrocarbon polymer material is selected from the group consisting of polypropylene, polyethylene, polystyrene, polyether, polyamide/polyethylene copolymer, polychloroprene, polyester, polyvinyl chloride, polyolefin, polyphenolic, polyhydroxyacid, ABS epoxy, and corresponding copolymers and blends; the fluorocarbon polymer material is selected from the group consisting of polytetrafluoroethylene, expanded polytetrafluoroethylene, polytetrafluoroethylene/polyethylene copolymer, fluorinated ethylene propylene, polyvinylidene fluoride, hexafluoropropylene, and corresponding copolymers and blends; the elastomer polymer material is selected from the group consisting of polyurethane, polysiloxane, polyisoprene, silicone, styrene butadiene, natural rubber, latex rubber, and corresponding copolymers and blends; the engineering thermoplastic polymer material is selected from the group consisting of polyethyleneterephthalate, polycarbonate, polyamide, polyaramid, polyaryl ether ketone, polyacetal, polyphenylene oxide, polysulfone, polyethersulfone, regenerated cellulose, polyamino acids, polyarylsulfone, polyphenylene sulphide, polybutyl-terephthalate (PBT), poly(glycolide), HEMA and corresponding copolymers and blends; and the metallic material is selected from the group consisting of stainless steel, cobalt-chromium-molybdenum alloy, pure titanium, and titanium alloys.



32. (New) The composition of matter of Claim 5 wherein each R when present in the MAP structure comprises a total of up to about 50 amino acids, and wherein each R<sub>1</sub> to R<sub>16</sub> comprises GTPGPQGIAGQRGVV (SEQ ID NO:1).

33. (New) The composition of matter of Claim 5 wherein each R when present in the MAP structure is GTPGPQGIAGQRGVV (SEQ ID NO:1).